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EXAMINER	
MCCALISTER, WILLIAM M	
ART UNIT	PAPER NUMBER
3753	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTOmail@beyerlaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/569,783	TANAKA ET AL.	
	Examiner	Art Unit	
	WILLIAM MCCALISTER	3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim 11 stands withdrawn. New claims 21-26 were added. Claims 1-10 and 12-26 are pending for immediate consideration.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10 and 12-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

a. All of the independent claims have been amended to recite the negative limitation “without pressure regulation between the flow control component and pressure detector".

i. The drawings do not show a pressure regulator between the flow control component and the pressure detector. However, because drawings consist of nothing more than positive indications of features that do exist, they cannot show that a particular feature does not exist. Stated differently, a non-illustrated feature is seen only as the absence of

evidence to show positive contemplation of that feature, and not as evidence that the absence of that feature was positively contemplated.

ii. Applicant argues that the presence of a pressure regulator between the pressure sensor and the flow control component would deteriorate the function of Applicant's device, since it would preclude the pressure sensor from accurately reflecting the discharge rate of the tank, and that the pressure sensor's absence therefore must have been contemplated (Remarks, p. 10-12). In response, Applicant's argument assumes that all pressure regulators regulate both upstream and downstream pressure, which they do not. For instance, a pressure regulator that regulates downstream pressure only (as most do) could have been contemplated as being located downstream of Applicant's pressure sensor, yet still be located "between the pressure sensor and the flow control component", without affecting the readings of the pressure sensor upstream therefrom.

b. New claims 21, 22, 24 and 25 recite "wherein the standard level is obtained by a previously conducted process of fixing the aperture ..." No support has been found for obtaining the standard level based on a previously conducted process of fixing the aperture. Applicant has not pointed to any support, nor argued this feature's inherency.

c. New claim 26 is rejected because it uses the phrase "consists of" (line 10), which excludes any elements other than those recited. This is seen essentially

as a negative limitation. There is no evidence that Applicant contemplated the absence of all elements other than those recited.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. All of the independent claims employ the transitional phrase "comprising" "'Comprising' is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim." *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986) Applying this rule the claims at hand, the term "comprising" would indicate that any other element may be present (including a pressure regulator) without departing from the scope of the claims. However, the claims have also been amended to recite “without pressure regulation between the flow control component and pressure detector", which would seem to preclude the presence of a pressure regulator.

5. is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The preamble uses the term “comprising” (which is non-limiting), but line 10 uses the phrase “consists of” (which is limiting). Which should take precedence?

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-5, 7, 9, 10, 12-17, and 19-26 as understood are rejected under 35 U.S.C. 102(b) as being anticipated by Ollivier (US 6,450,200).

Regarding claim 1, Ollivier discloses a flow control device (see FIG 1A) for controlling a flow of a fluid in a channel in which the fluid is supplied to a target where a pressure is lower than a fluid supply source, comprising:

a first opening and closing valve (14) for opening and closing the channel;

a flow control component (22) with a flow control valve mechanism for controlling the flow of the fluid flowing through the channel (inherently, it's a mass flow controller);

a pressure detector ~~(6)~~ (18; see FIG 1B) capable of detecting a pressure of the fluid on a same side as the flow control valve mechanism (22) relative to the first opening and closing valve (i.e., it's upstream of the flow control valve mechanism);

the flow control component (22) and pressure detector (18) arranged without pressure regulation of the fluid between the flow control component (22) and pressure detector (18) (pressure regulator 16 is not located between members 22 and 18); and

a deviation measurement/control component (3) for calculating a deviation of the flow controlled by the flow control component from a standard level (from the "specified, desired flow rate", col. 6 line 6),

wherein the deviation measurement/control component (3):

fixes an aperture of the flow control valve mechanism (22) at a selected aperture opening (corresponding to the “controlled flow rate”; see col. 5 lines 59-67) and measures changes in the pressure using the pressure detector while the channel is closed by the first opening and closing valve (14) (“the pressure drop … is measured … while interrupting the flow ... with valve 14”; see col. 5 lines 61-65),

wherein the aperture remains fixed at the selected aperture opening during the pressure change measurement (“the pressure drop … is measured … while … continuing to deliver process gas … at the controlled flow rate”, where “the controlled flow rate” implies a fixed aperture size in flow control component 22 because pressure regulator 16 acts to hold constant the pressure of fluid entering member 22), and

calculates the deviation from the standard level associated with the selected aperture opening based on the measured changes in the pressure (Ollivier’s measured pressure change is used to calculate an actual flow rate {col. 6 lines 1-5}, the actual flow rate is compared to the standard level {i.e. – it is compared to the "specified, standard flow rate", col. 6 lines 5-7}, and the standard level is *associated with* the selected aperture opening because the standard level is used to set the setpoint flow rate of the MFC {col. 6 lines 7-10, 12-16}, wherein the setpoint of the MFC determines the aperture opening of the MFC for each iteration).

Regarding claim 2, Ollivier discloses:

the flow control component (22) to comprise a flow detector capable of

measuring the flow of the fluid flowing through the channel on the same side as the flow control valve mechanism relative to the first opening and closing valve (MFCs inherently have a flow sensor, and MFC 22 is downstream of valve 14), and

controlling the flow of the fluid flowing through the channel by adjusting an aperture of the flow control valve mechanism based on a target flow and the flow measured by the flow detector (this is the definition of a MFC with a feedback loop), and

the deviation measurement/control component (3) to be capable of adjusting an output level (the setpoint sent to the MFC) representing the flow by the flow detector (the MFC's flow detector sets the flow rate, which affects measurement by the pressure sensors) based on the deviation from the standard level (col. 6 lines 1-10).

Regarding claim 3, Ollivier discloses a second opening and closing valve (24) for opening and closing the channel on a side opposite the first opening and closing valve (14) relative to the flow detector (valve 24 is downstream of MFC 22, valve 14 is upstream of MFC 22). Further, the deviation measurement/control component (3) is capable of reading the output level (of the pressure sensors) representing the flow by

the flow detector (the pressure sensors and the MFC's flow detector detect the same flow) while the channel is closed by the first and second opening and closing valves (while no flow occurs), and adjusting an output level representing zero flow by the detector (just as it does when the second valve is open).

Regarding claim 4, Ollivier discloses an accumulator (5) as claimed.

Regarding claim 5, Ollivier discloses:

a temperature detector capable of measuring a temperature of the fluid on the same side as the flow control valve mechanism relative to the first opening and closing valve (downstream of the on/off valve 14, see col. 5 lines 30-32), wherein

the deviation measurement/control component further calculates the deviation from the standard level (see col. 5 lines 35-47) based on:

an initial pressure P_0 of the fluid at a first time (inherent to $\Delta P/\Delta t$) in a certain time interval (Δt) including a time the channel is closed by the first opening and closing valve (col. 5 lines 60-63),

an absolute temperature T_1 of the fluid at a second time period in the certain time interval (Δt), and

a time period from a time the pressure of the fluid reaches a certain first standard pressure P_1, after the channel is closed by the first opening and closing valve, until a time the pressure reaches a certain second standard pressure P_2 which is different from the first standard pressure P_1 (inherent to $\Delta P/\Delta t$).

Regarding claim 7, Ollivier discloses a mass flow control device comprising a flow control component which has in a channel (1) through which a fluid flows:

a flow detector (inherent to MFC 22) for detecting a mass flow of the fluid that flows through the channel and outputting a flow signal; and

a flow control valve mechanism (inherent to MFC 22) for controlling the mass flow by altering a valve aperture by means of valve drive signals, and controls the flow control valve mechanism based on an externally input flow set signal (the set point) and the flow signal (the feedback), wherein a flow control valve mechanism aperture is fixed at a selected aperture opening in response to a selected valve drive signal (before valve 14 is shut, see col. 5 lines 60-67),

the mass flow control device comprises a deviation measurement/control component which has in the channel:

a first opening and closing valve (14) for opening and closing the channel;

an accumulator (5) having a certain volume; and

a pressure detector ~~(6)~~ (18; see FIG 1B) for detecting a pressure of the fluid and outputting a pressure detection signal, and controlling the first opening and closing valve and the accumulator and the pressure detector to perform a mass flow test operations (col. 6 lines 1-10), based on

the measured pressure changes measured while the valve aperture remains fixed at the selected aperture opening by the valve drive signals

(because pressure regulator 16 acts upstream of MFC 22, the opening of MFC 22 is fixed for any given iteration) and

a predetermined standard pressure change characteristic associated with the selected aperture opening (see generally col. 5 line 54 to col. 6 line 22; the measured pressure change profile is compared to the expected flow rate through the MFC),

wherein the pressure of the fluid is not regulated between the flow control component (22) and pressure detector (18) (pressure regulator 16 is not located between members 22 and 18).

Regarding claim 9, see the analysis of claim 3.

Regarding claim 10, Ollivier discloses the first opening and closing valve, the accumulator, and the pressure detector to be provided further upstream than the flow detector and the flow control valve mechanism (see FIG 1A).

The method steps of claims 12-17, 19 and 20 would necessarily be performed during the normal and usual operation of Ollivier's device. Regarding claim 19, the verification flow is altered by selection of the aperture opening which occurs in the next iteration of the test procedure (see col. 6 lines 13-22).

Regarding claims 21, 22, 24 and 25, Ollivier's deviation measurement/control component calculates the deviation from the standard level associated with the selected aperture opening based on the measured changes in the pressure (Ollivier's measured pressure change is used to calculate an actual flow rate {col. 6 lines 1-5}, the actual flow rate is compared to the standard level {i.e. – it is compared to the "specified, standard flow rate", col. 6 lines 5-7}, and the standard level is *associated with* the selected aperture opening because the standard level is used to set the setpoint flow rate of the MFC {col. 6 lines 7-10, 12-16}, wherein the setpoint of the MFC determines the aperture opening of the MFC for each iteration), wherein the standard level is obtained (the standard level, or "specified, desired flow rate" is obtained at the output of the MFC since the purpose of the MFC is to achieve its specified, desired flow rate) by a previously conducted process (the following data must be obtained before it can be used in the comparison function) of fixing the aperture of the flow control valve and by measuring pressure changes in actual flow rate ("the pressure drop … is measured … while interrupting the flow ... with valve 14"; see col. 5 lines 61-65).

Regarding claim 23, Ollivier discloses a temperature detector (see col. 5 lines 30-32) arranged to measure a temperature of the fluid on the same side as the flow control valve mechanism (22) relative to the first opening and closing valve (14), wherein

the deviation measurement/control component calculates the deviation from the standard level based on:

an initial pressure P0 (the initial pressure in the measurement of the drop in pressure as the capacity empties over time) of the fluid at a first time in a certain time interval including a time the channel is closed by the first opening and closing valve ("the pressure drop … is measured … while interrupting the flow ... with valve 14"; see col. 5 lines 61-65),

an absolute temperature T1 of the fluid at a second time period in the certain time interval (see col. 5 line 47, the temperature is in degrees Kelvin), and

a time period Δt from a time the pressure of the fluid reaches a certain first standard pressure P1 after the channel is closed by the first opening and closing valve until a time the pressure reaches a certain second standard pressure P2 which is different from the first standard pressure P1 (Ollivier measures $\Delta P/\Delta t$; see col. 5 lines 43-46).

Regarding claim 26, Ollivier discloses a flow control device for controlling a flow of a fluid in a channel in which the fluid is supplied to a target where a pressure is lower than a fluid supply source, the device comprising:

a first opening and closing valve (14) for opening and closing the channel;

a flow control component (22) with a flow control valve mechanism for controlling the flow of the fluid flowing through the channel (inherently, it's a mass flow controller);

a pressure detector (18; see FIG 1B) capable of detecting a pressure of the fluid on a same side as the flow control valve mechanism (22) relative to the first opening and closing valve (14);

the device further arranged so that a fluid flow path between the flow control component (22) and pressure detector (18) consists of one of a gas flow tube or a mass flow detection system (there is a tube directly upstream of the MFC 22 that connects MFC 22 to manifold 7); and

a deviation measurement/control component (3) for calculating a deviation of the flow controlled by the flow control component from a standard level (from the "specified, desired flow rate"; col. 6 line 6), wherein

the deviation measurement/control component (3):

fixes an aperture of the flow control valve mechanism (22) at a selected aperture opening (corresponding to the "controlled flow rate"; see col. 5 lines 59-67) and measures changes in the pressure using the pressure detector while the channel is closed by the first opening and closing valve (14) ("the pressure drop … is measured … while interrupting the flow ... with valve 14"; see col. 5 lines 61-65), wherein the aperture remains fixed at the selected aperture opening during the pressure change measurement ("the pressure drop … is measured … while … continuing to deliver process gas … at the controlled flow rate", where "the controlled flow rate" implies a fixed aperture size in flow control component 22 because pressure regulator 16 acts to hold constant the pressure of fluid entering member 22), and

calculates the deviation from the standard level associated with the selected aperture opening based on the measured changes in the pressure (Ollivier's measured pressure change is used to calculate an actual flow rate {col.

6 lines 1-5}, the actual flow rate is compared to the standard level {i.e. – it is compared to the "specified, standard flow rate", col. 6 lines 5-7}, and the standard level is *associated with* the selected aperture opening because the standard level is used to set the setpoint flow rate of the MFC {col. 6 lines 7-10, 12-16}, wherein the setpoint of the MFC determines the aperture opening of the MFC for each iteration).

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1-5, 7, 9, 10, 12-17, and 19-26 as understood are alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Ollivier in view of Wilmer (US 5,865,205).

Regarding claims 1, 2, and 7, Ollivier substantially discloses the invention as claimed. However, should it be determined that Ollivier does not inherently disclose MFC (22) to comprise a set point/measured flow rate comparator, it would have been obvious to one of ordinary skill in the art at the time of invention to use such a MFC to control flow through Ollivier's system. Wilmer teaches that it was known to use such a MFC (308, 360, 370, 332, 357) to control flow through a similar system. The remaining claim recitations read on this combination as they do on Ollivier alone.

Regarding claim 3, Ollivier discloses a second opening and closing valve (24) for opening and closing the channel on a side opposite the first opening and closing valve (14) relative to the flow detector (it's downstream of the MFC). Further, the deviation measurement/control component (Wilmer's MFC comparator 308) would be capable of reading the output level representing the flow by the flow detector while the channel is closed by the first and second opening and closing valves (no flow), and adjusting an output level representing zero flow by the detector (since this is the flow that would be detected).

Regarding claims 4, 5, 9 and 10, see the analyses set forth under paragraph 3 above.

The method of claims 12-17, 19 and 20 would necessarily be performed during the normal and usual operation of the Ollivier-Wilmer device.

Regarding claims 21-26, see the corresponding analyses set forth above.

10. Claim 6 as understood is rejected under 35 U.S.C. 103(a) as being unpatentable over Ollivier (and alternatively Ollivier in view of Wilmer) as applied to claim 2 above.

Mathematical derivation of an expression from well known physical relationships, and the use of functional equivalents thereof (including the use of a ratio to indicate a

difference), was within the skill of an artisan at the time of invention and it would have been obvious to do so with Ollivier's system to achieve similar results.

11. Claim 8 as understood is rejected under 35 U.S.C. 103(a) as being unpatentable over Ollivier (and alternatively over Ollivier in view of Wilmer) as applied to claim 7 above.

Ollivier discloses the invention as claimed, including that it was known in the art at the time of invention to calibrate a set point based on a result of a test (see col. 6 lines 12-16). Neither Ollivier nor Wilmer teaches the step of calibrating the flow detector. However, an MFC's actuation signal was known to be, by definition, a function of the set point and flow rate measurement only. Calibration of a MFC could therefore be performed in a finite number of ways, i.e. - on either of the two inputs, the output, or a combination thereof. Predictably, since only these three signals affect actuation of the MFC, calibration of one rather than the other would have resulted in calibration of the MFC. It therefore would have been obvious to one of ordinary skill in the art at the time of invention to calibrate the flow rate measurement instead of the set point to predictably achieve the same result of MFC calibration.

12. Claim 18 as understood is rejected under 35 U.S.C. 103(a) as being unpatentable over Ollivier (and alternatively over Ollivier in view of Wilmer) as applied to claim 17 above.

The analysis of claim 8 set forth under paragraph 7 above is incorporated by reference. Normal and usual operation of the resultant device would have necessarily involved the step of calibrating the flow detector automatically based on the test results.

Response to Arguments

13. Applicant's arguments filed 2/3/2010 have been fully considered but they are not persuasive.

a. Applicant has suggested that an explicit recitation regarding the absence of pressure regulation could be added to the specification (Remarks, p. 10). In response, support for such a recitation has not been found. The response to Applicant's arguments regarding such support is found in the rejection above.

b. Applicant argues that Ollivier does not disclose the absence of pressure regulation between the pressure sensor and the flow control component. In response, Ollivier discloses a second pressure sensor (18; see FIG 1B), and discloses the pressure regulator (16) to be outside of the space between this pressure sensor and the flow control component (22).

c. Applicant argues that Ollivier does not disclose the limitations of new claims 26 (Remarks, p. 12). The Examiner's interpretation of this language is set forth in the rejection above.

d. Applicant argues that "Ollivier, in reality, dynamically controls the aperture opening based on a setpoint flow rate ... and accordingly, the aperture opening

itself is not fixed to the amount corresponding to the setpoint" (Remarks, pp. 12-13). In response, Ollivier's pressure measurement occurs while the first valve is closed (Ollivier, col. 5 lines 60-65). Further, because Ollivier employs a pressure regulator (16) upstream of the control valve (22), the inlet pressure at the control valve (22) does not change while the first valve is closed, and the aperture size therefore would remain constant during this time period in order to deliver the process gas at the controlled rate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM MCCALISTER whose telephone number is (571)270-1869. The examiner can normally be reached on Monday through Friday, 9-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WILLIAM MCCALISTER/
Examiner, Art Unit 3753

/Robin O. Evans/
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